REMARKS

The Patent Office is thanked for the allowance of claims 4, 5, 14, 15, and 18, and the indication of allowable subject matter in claims 8, 26, and 28. It is believed that base claims 6, 23, and 27, corresponding to claims 8, 26, and 28 are themselves allowable and so claims 8, 26, and 28 have not been rewritten in independent form.

Claims 10 and 20 have been amended to more clearly define the invention. The support for the amended subject matter is found on page 16, lines 22-23, of the original patent application as filed by Applicant. It is respectfully submitted that no new matter has been added.

Claim 16 has been amended on line 10 to correct a typographical error. It is respectfully submitted that no new matter has been added.

Applicant has added dependent claims 29-31 to the scope of the claimed invention. Support for the newly claimed subjected matter is found on page 16, lines 22-23, of the original patent application as filed by Applicant. It is respectfully submitted that no new matter has been added.

The Patent Office rejected claims 1-3, 11-13, 21, and 23-25 under 35 U.S.C. 103(a) as being unpatentable over Matthews, U.S. Patent No. 6,084,858.

Claim 1 recites "A method for routing data packets in a wireless network, comprising... determining a route having a **maximum link bandwidth and a minimum traffic load.**"

Claim 11 recites "A computer program embodied on a computer readable medium and comprising computer program code segments for use by at least one data processor when implementing a routing protocol in a wireless network, comprising ... a third computer program code segment that uses the calculated connectivity metric to determine a route having a **maximum link bandwidth and a minimum traffic load ...**"

Claim 23 recites "A mobile node comprising means for coupling to a wireless network ... means, responsive to the calculated connectivity metric, for determining a route having a **maximum link bandwidth and a minimum traffic load** ..."

The claimed invention as found in claims 1-3, 11-13, 21, and 23-25, "provides a routing protocol to enable a mobile node to bypass a heavily loaded node, and find a route having a larger bandwidth."

The Patent Office asserted that Matthews, column 4, lines 50-54, and column 7, lines 12-18, disclose "using the calculated connectivity metric $(Z_p(i))$, determining (Step 18) a route having a maximum link bandwidth and a minimum traffic load. After all paths are evaluated by the traversal value vectors, "the path which best fits the desired result for presentation is selected." However, Matthews does not disclose determining a route having a maximum link bandwidth, a route having a minimum traffic load, nor a route having both a maximum link bandwidth and a minimum traffic load. Even if considering preferring a path having a higher bandwidth value as relating to a maximum link bandwidth, Matthews does not disclose or suggest a route having a minimum traffic load since two nodes having a maximum link bandwidth may have non-identical throughputs and so represent two different minimum traffic loads.

Thus, claims 1-3, 11-13, 21, or 23-25 are allowable over the prior art of record.

Newly added dependent claims 29-31 further protect the scope of Applicant's claimed invention.

The Patent Office rejected claims 6, 7, 16, 17, and 27 under 35 U.S.C. 103(a) as being unpatentable over Matthews, U.S. Patent No. 6,084,858, in view of Momosaki, U.S. Published Patent Application No. 2003/0119538.

Claim 6 recites "A method for routing data packets in a wireless network, comprising

estimating a link bandwidth of at least one network node; calculating a connectivity metric based on the estimated link bandwidth; distributing information concerning the calculated connectivity metric; and using the calculated connectivity metric, determining a route having **a maximum link bandwidth and a minimum traffic load**, where **estimating includes considering a node's status and the number of the node's Slaves**."

Claim 16 recites "A computer program embodied on a computer readable medium and comprising computer program code segments for use by at least one data processor when implementing a routing protocol in a wireless network, comprising . . . a third computer program code segment that uses the calculated connectivity metric to determine a route having a **maximum link bandwidth and a minimum traffic load**, where said **first computer program code segment considers a node's status and the number of the node's Slaves when estimating the link bandwidth of the node**."

Claim 27 recites "A digital data storage medium embodying a computer-executable program comprising operations of estimating a link bandwidth of at least one network node in a wireless multi-hop network using at least in part a **consideration of a number of, and the role played by, other nodes** that are coupled to the at least one node, where the role comprises one of a master (M), a slave (S), and a participant in multiple piconet (PMP); . . . **determining a route in a load-balanced manner for a packet**."

Applicant's claimed invention "provides a routing protocol to enable a mobile node to bypass a heavily loaded node, and find a route having a larger bandwidth" (page 7, lines 8-12, of Applicant's specification).

The Patent Office asserted that "Momosaki et al disclose estimating the amount of bandwidth needed in a system by determining the node's status (master or slave) and the number of the node's slaves" (page 6, lines 9-10, of the Office Action mailed June 29, 2005) and cites paragraphs 0075-0076 of Momosaki as support. Although Momosaki, in paragraphs 0075-0076, does disclose "the upstream side device becomes a master and the downstream side device

becomes a slave, and at most seven slaves can be connected to a single master," "it is possible to reduce the number of slaves that can be connected according to the necessary throughput," and "the number of slaves that can be connected is limited to at most four," Momosaki does not disclose or suggest "estimating includes considering a node's status and the number of the node's Slaves" (claim 6), "said first computer program code segment considers a node's status and the number of the node's Slaves when estimating the link bandwidth of the node" (claim 16), nor "consideration of a number of, and the role played by, other nodes" (claim 27). Momosaki does not disclose that a node's status is considered in estimating. Furthermore, neither Matthews nor Momosaki disclose or suggest determining "a route having a maximum link bandwidth and a minimum traffic load" (claims 6 and 16), as discussed above regarding claims 1, 11, and 23, nor "determining a route in a load-balanced manner for a packet" (claim 27).

Thus, claims 6, 7, 16, 17, and 27 are allowable over the prior art of record.

The Patent Office rejected claims 9 and 19 under 35 U.S.C. 103(a) as being unpatentable over Matthews, U.S. Patent No. 6,084,858, in view of Hiroyuki, U.S. Published Patent Application No. 2003/0043746.

Claim 9 recites "A method for routing data packets in a wireless network, comprising... determining a route having **a maximum link bandwidth and a minimum traffic load**, where distributing information concerning **the calculated connectivity metric comprises inserting the value of the connectivity metric into a routing protocol packet in place of the value of a hop number.**"

Claim 19 recites "A computer program embodied on a computer readable medium and comprising computer program code segments for use by at least one data processor when implementing a routing protocol in a wireless network, comprising... a third computer program code segment that uses the calculated connectivity metric to **determine a route having a maximum link bandwidth and a minimum traffic load,** where **the value of the connectivity metric is inserted into a routing protocol packet in place of the value of a hop number.**"

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The Patent Office asserts "Hiroyuki et al disclose that finding an optimum path between nodes in a network comprises using a metric to compare paths" (page 8, lines 3-4, of the Office Action mailed June 29, 2005).

Hiroyuki discloses "The Djikstra method is a way to find out a path having a minimum metric between an entrance node used to guide a packet or a like into a network and an exit node used to guide the packet or the like outside the network. The metric is an index used when a path is found on a network and, as the metric, for example, a number of hops (number of nodes through which a packet or a like passes), delay time, bandwidth, costs, or a like are used" (paragraph 0006) and "In order to surely select the path pair from a network, a constraint condition to obtain two paths and constraint condition required to put these two paths into a state of disjoint relation. Also, if there is a limitation in processing capability (capacity) of a node or a link, a constraint condition to have a metric value in each route fall within a specified range is made necessary. Moreover, if it is necessary to designate a reference (which minimizes, for example, a bandwidth, delay, line cost or a like), on a basis of which the path pair is to be selected" (paragraph 0051).

Neither cited paragraph of Hiroyuki discloses or suggests the limitation of inserting the value of the connectivity metric into a routing protocol packet in place of the value of a hop number.

Furthermore, neither Matthews nor Hiroyuki disclose or suggest determining "a route having a maximum link bandwidth and a minimum traffic load" (claims 6 and 16), as discussed above regarding claims 1, 11, and 23.

Thus, claims 9 and 19 are allowable over the prior art of record.

The Patent Office rejected claims 10 and 20 under 35 U.S.C. 103(a) as being unpatentable over Matthews, U.S. Patent No. 6,084,858, in view of Hasegawa, U.S. Patent No. 5,878,029.

Claim 10 recites "A method for routing data packets in a wireless network, comprising . . . **calculating a connectivity metric is defined as a ratio of a maximum link bandwidth to the estimated link bandwidth; determining a route having a maximum link bandwidth and a minimum traffic load,** where distributing information concerning the calculated connectivity metric comprises **inserting the value of the connectivity metric into a routing protocol packet in conjunction with the value of a hop number.**"

Claim 20 recites "A computer program as in claim 11, where **the value of the connectivity metric is inserted into a routing protocol packet in conjunction with the value of a hop number, wherein the connectivity metric is defined as a ratio of the maximum link bandwidth to the estimated link bandwidth.**"

The Patent Office asserted (page 9, lines 1-12, of the Office Action mailed June 29, 2005) "Hasegawa et al disclose in Figure 28 that a source switch 20 comprises a route information collector 22 to collect and record information on routes to the destination switch 30; the route information including the hop number, the current utilized bandwidth and the residual bandwidth. The information is collected by sending out RM cells (Figure 3) to transmit switches, which loads the route information into the data field of the RM cells. Refer to Column 19, line 39, to Column 20, line 27. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include inserting the value of the connectivity metric (bandwidth) into a routing protocol packet in conjunction with the value of a hop number; the motivation being that a combination of both the hop number and bandwidth allows the system to choose the most optimum and efficient path. By minimizing the number of hops, the transmission will be faster and require less processing at intermediate nodes. By minimizing the bandwidth of one path, more bandwidth is available for other transmissions in the network."

Neither Matthews nor Hasegawa disclose a connectivity metric defined as a ratio of the maximum link bandwidth to the estimated link bandwidth nor that this connectivity metric is inserted into a routing protocol packet in conjunction with a value of a hop number.

Furthermore, neither Matthews nor Hasegawa disclose or suggest determining "a route having a maximum link bandwidth and a minimum traffic load" (this limitation is expressed in claim 10 and found in claim 20 through its base claim 11), as discussed above regarding claims 1, 11, and 23.

Thus, claims 10 and 20 are allowable over the prior art of record.

The Patent Office is respectfully requested to reconsider and remove the rejections of the claims under 35 U.S.C. 103(a) based on Matthews et al., alone or in combination with Momosaki, Hiroyuki, or Hasegawa, and to allow all of the pending claims 1-21 and 23-31 as now presented for examination. An early notification of the allowability of all of the pending claims is earnestly solicited.

Respectfully submitted:

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